

## **REMARKS**

In response to the Office Action, Claim 1 is amended. Claim 15 was previously cancelled. Claims 1-14 remain in the Application. Reconsideration of the pending claims is respectfully requested in view of the above amendments and the following remarks.

### **I. Claims Rejected Under 35 U.S.C. § 103(a)**

A. Claims 1-6 and 10-11 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Sartorius et al., *Dispersive Self Q-Switching in Self-Pulsating DFB Lasers*, IEEE JOE, vol. 33, No. 2, February 1997, pgs. 211-217 (“Sartorius”) in view of U.S. Patent No. 6,018,541 issued to Huang (“Huang”). Applicants respectfully traverse the rejection.

To establish a *prima facie* case of obviousness, the relied upon references must teach or suggest every limitation of the claim such that the invention as a whole would have been obvious at the time the invention was made to one skilled in the art.

Claim 1 is amended to incorporate a portion of allowable claims 7 and 8. Amended Claim 1 recites the elements of:

“an external cavity including a phase control section and an amplifier section for controlling the phase and strength of the laser light fed back to the complex-coupled DFB laser section after round-trip through the phase control section and the amplifier section by means of the currents injected into the phase control section and the amplifier section, the phase control section having a guiding layer as a passive waveguide that controls a phase variation of feedback laser light, the amplifier section having an active structure between two guiding layers having band gaps of an equal length to control the strength of the feedback laser light...” (emphasis added).

Applicants submit that none of the cited references teach or suggest the limitations of “the amplifier section having an active structure between two guiding layers having band gaps of an equal length to control the strength of the feedback laser light.”

In the rejection of Claim 6 (see Office Action at page 5), the Examiner characterizes the n-InGaAsP, InGaAsP and n-InGaAsP disclosed by Sartorius as the recited first guiding layer, the active layer and the second guide layer (see Figure 1 of Sartorius). However, Sartorius discloses

that the first and the second guiding layers have band gaps of different lengths (1.18 $\mu$ m and 1.3 $\mu$ m, respectively). Thus, Sartorius does not disclose the amended limitations of an amplifier section having an active structure between two guiding layers having band gaps of an equal length. Huang and the other cited references do not supply the missing elements. Thus, Claim 1 and its independent claims are non-obvious over the cited references.

Moreover, Sartorius does not teach one complex-coupled DFB section. Rather, Sartorius discloses two DFB sections (index-coupled DFB sections). Huang is relied on for disclosing a DFB laser waveguide wherein the grating is complex coupled. However, Huang does not cure the deficiency of Sartorius. Specifically, Huang does not disclose that two DFB sections can be complex coupled. Thus, Claim 1 and its dependent claims are non-obvious over the cited references for this additional reason.

Accordingly, reconsideration and withdrawal of the § 103 rejection of Claims 1-6 and 10-11 are requested.

B. Claim 9 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Sartorius and Huang in view of U.S. Patent No. 5,177,758 issued to Oka et al (“Oka”).

Claim 9 depends from Claim 1 and incorporates the limitations thereof. Thus, for at least the reasons mentioned above in regard to Claim 1, Sartorius and Huang do not teach or suggest each of the elements of Claim 9.

The Examiner cites Oka for teaching the alignment of the central axis. However, Oka does not teach or suggest the amended limitations of an amplifier section having an active structure between two guiding layers having band gaps of an equal length. Thus, Claim 9 is non-obvious over the cited references. Accordingly, reconsideration and withdrawal of the § 103 rejection of Claim 9 is requested.

C. Claim 12 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Sartorius and Huang in view of U.S. Patent No. 5,841,799 issued to Hiroki et al (“Hiroki”).

Claim 12 depends from Claim 1 and incorporates the limitations thereof. Thus, for at least the reasons mentioned above in regard to Claim 1, Sartorius and Huang do not teach or suggest each of the elements of Claim 12.

Hiroki does not teach or suggest the amended limitations of an amplifier section having an active structure between two guiding layers having band gaps of an equal length. Thus, Claim 12 is non-obvious over the cited references. Accordingly, reconsideration and withdrawal of the § 103 rejection of Claim 12 is requested.

D. Claim 13 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Sartorius and Huang in view of U.S. Patent No. 4,995,048 issued to Kuindersma et al. (“Kuindersma”).

Claim 13 depends from Claim 1 and incorporates the limitations thereof. Thus, for at least the reasons mentioned above in regard to Claim 1, Sartorius and Huang do not teach or suggest each of the elements of Claim 13.

The Examiner cites Kuindersma for teaching a grated laser structure incorporated monolithically with a phase control section and an amplifier section, wherein the amplifier section is located between the grating and the phase control sections. However, Kuindersma does not teach or suggest the amended limitations of an amplifier section having an active structure between two guiding layers having band gaps of an equal length. Thus, Claim 13 is non-obvious over the cited references. Accordingly, reconsideration and withdrawal of the § 103 rejection of Claim 13 is requested.

E. Claim 14 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Sartorius and Huang in view of U.S. Patent No. 6,031,860 issued to Nitta et al (“Nitta”).

Claim 14 depends from Claim 1 and incorporates the limitations thereof. Thus, for at least the reasons mentioned above in regard to Claim 1, Sartorius and Huang do not teach or suggest each of the elements of Claim 14.

Nitta does not teach or suggest the amended limitations of an amplifier section having an active structure between two guiding layers having band gaps of an equal length. Thus, Claim 14 is non-obvious over the cited references. Accordingly, reconsideration and withdrawal of the § 103 rejection of Claim 14 is requested.

## II. Allowable Subject Matter

Applicants note with appreciation the Examiner's indication that Claims 7 and 8 would be allowable if rewritten in independent form. Applicants submit that the amendments to Claim 1 have placed these dependent claims in condition for allowance. Accordingly, reconsideration and withdrawal of the objection of Claims 7 and 8 are requested.

### CONCLUSION

In view of the foregoing, it is believed that all claims are now in condition for allowance and such action is earnestly solicited at the earliest possible date. If there are any additional fees due in connection with the filing of this response, please charge those fees to our Deposit Account No. 02-2666.

Respectfully submitted,

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